

EWD-P as an example of a “The Best of Good Practice” project

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Abstract—The European Document Exchange System – Poland (EWD-P), developed by Rodan Systems SA is one of the most modern electronic document exchange systems in European Union. EWD-P is a workflow system that facilitates decision-making within the state bureaucratic system, with a special brief to work out official Polish government standpoints on numerous legislative issues constantly arising within the EU. The EWD-P project has created an effective platform for electronic exchange of documents related to the EU legislative process. The intelligent workflow management functionality aims to support a complex flow of documents through the meanders of the central government administration. The EWD-P system includes a high-level classification of documents using an artificial intelligence technique for document categorization. The EWD-P system simplifies interaction between ministerial departments involved in elaboration of a final common position and facilitates a more efficient organization of work within government and other public administration institutions involved in the EU legislative process.

Keywords— *The European Document Exchange System – Poland, EWD-P, workflow engine, classification and categorization of documents, central repository, advanced search engine, Rodan Systems, best practice project.*

1. Introduction

1.1. Specific problem

An important ingredient of the European Union enlargement process was to ensure conformity of a candidate state's existing legislation to the EU procedures and regulations. Such conformity, but with reference to proposed new legislation continues to be required after the accession.

Elaboration of an official Polish standpoint is a complex and recurring process (more than 2000 process instances a month). It requires involvement of relevant units of central government (all ministerial departments) and collaborative efforts of selected advisory groups from various bureaucratic domains (the state employs more than 12 000 civil servants). The results' delivery within often tight time limits is critical because failure to deliver on time means unconditional acceptance of the proposed EU directive. The official Polish government reply to a EU proposal has at times to be passed on to the Polish Representation Offices at Brussels in a very short time – sometimes counted in hours rather than days.

Such blitz-like decision-making requires high-level techniques of classification and document distribution as well

efficient cooperation between various teams of advisors. Before the introduction of a dedicated IT system a significant percent of standpoints could not be properly elaborated, hampering the overall integration process [1].

In pre-EWD-P days, the main problem concerned expensive and time consuming procedures in distribution of EU documents to Polish institutions and experts. There were also considerable difficulties in accessing the central repository and thus the history of the official standpoint elaboration process. In short: there were problems in the process of identification and procurement of information as well as of related documents (each institution had different databases that were not synchronized). Together these difficulties prevented the government from applying an optimal and proper standpoint elaboration process and underlined the noticeable gap in the decision-making processes between the internal (interdepartmental) and external (Poland–UE) standards.

1.2. General background

The European legislative procedures are based on a complex infrastructure of working groups and committees focusing on assorted domains governed by the European Parliament regulations and the European Commission directives. Representatives of all member states participate in the legislative process preparing appropriate position documents and participating in respective working group and committee meetings. In order to facilitate the document exchange between the General Secretariat and member state governments an information system called the U32 mail was implemented in 2002. Each member state (receiving about 100–300 documents daily) has been provided with two access points to the U32 mail system, one in a selected location in the member state central government and one in the Brussels representation office. Most of the documents pertain to new issues requiring a position to be presented by the member state government, the rest pertain to the already existing, i.e., “current”, cases. The U32 mail system initially classifies the documents and enables defining simple distribution rules.

For the majority of the EU documents a Polish response must be prepared and delivered by a certain date. If the deadline for preparation is not met, it is assumed that there is no objection to the proposals contained in the original EU document, which is deemed fully accepted. When a Polish response is attained, it is sent to the Representation Office at Brussels which in turn presents this reply to the Council's relevant office.

Stringent discipline imposed by the European legislative procedures, usually involving several central government agencies and authorized individuals participating in various auxiliary roles, calls for advanced IT functions to provide the required level of technological support.

The EWD-P system enlarges the powers of the U32 mail system in a significant way. It supports the process of elaboration of Poland's official government standpoint and stores all documents sent via U32 mail from General Secretary of the Council of the European Union and from the country that at the time presides over the EU Council.

1.3. Policy context and strategy

In 2004 Poland became a member of the European Union. From that date on, the process of elaboration of the official Polish standpoint is governed by a directive requiring obligatory consultations of Poland's government standpoint between the ministerial departments.

Poland's IT strategy – ePoland 2004–2006, defining the direction of IT development for the public administration has been prepared by the Polish government.

The EWD-P system has been developed and implemented to provide an effective platform for electronic exchange of documents involving the UE legislative process between all Polish public institutions.

2. Solution

2.1. Objectives

The prime objective was to create a system, which would assure that the complex process of elaboration of a Polish government standpoint is executed efficiently, accurately and, most importantly, on time.

More specific objectives:

- Storing in one place a full knowledge related to subjects concerning UE legislative process and Polish public institution.
- Monitoring a progress of tasks within a process of working out a standpoint for a specific case.
- A selection of proper experts for specific cases and possibility of consultation among them.
- Accessing a full history of the elaboration process for a specific case.

2.2. The project

In order to achieve these objectives a project called EWD-P was launched with responsibility for creation of a system that enhances the individual advisors' and experts' input in the process of elaboration of the standpoints and improves collaboration during the meetings of various working groups.

The range of tasks within a scope of the EWD-P project included:

- system analysis;
- conceptual design of the system;
- technical design of the system's components;
- development of the application;
- testing and verification;
- procurement and delivery of equipment (hardware, including servers and data communication devices);
- delivery of software licences required for system development and operations;
- setting up a production and a training environment (installation of all software and the application);
- import of historical data;
- preparation of system's documentation;
- organization and execution of training for ca. 1000 users divided into three groups: coordinators, departmental coordinators and experts;
- technical support for the system users; the EWD-P system has to meet the needs of users from 19 government ministries and institutions.

The duration of the project was very short for such a complex solution. The EWD-P system implementation and deployment was possible only due to the fact that the project used results constructed within a R&D project – ICONS (IST-2001-32429) [3]. The development was based on generic and powerful services of the ICONS platform for knowledge management intensive portals development. The EWD-P system is the first commercial exploitation of the ICONS platform.

2.3. The EWD-P system

The system has been designed to apply technology directly in support of business processes. The EWD-P application has been developed in OfficeObjects®Workflow environment and J2EE technology. The architecture of the system is illustrated in Fig. 1.

The main features of the system:

- A central repository armed with a document management mechanism:
 - automatic reading of information from U32 mail system;
 - classification/indexation of documents;
 - cross-reference between documents;

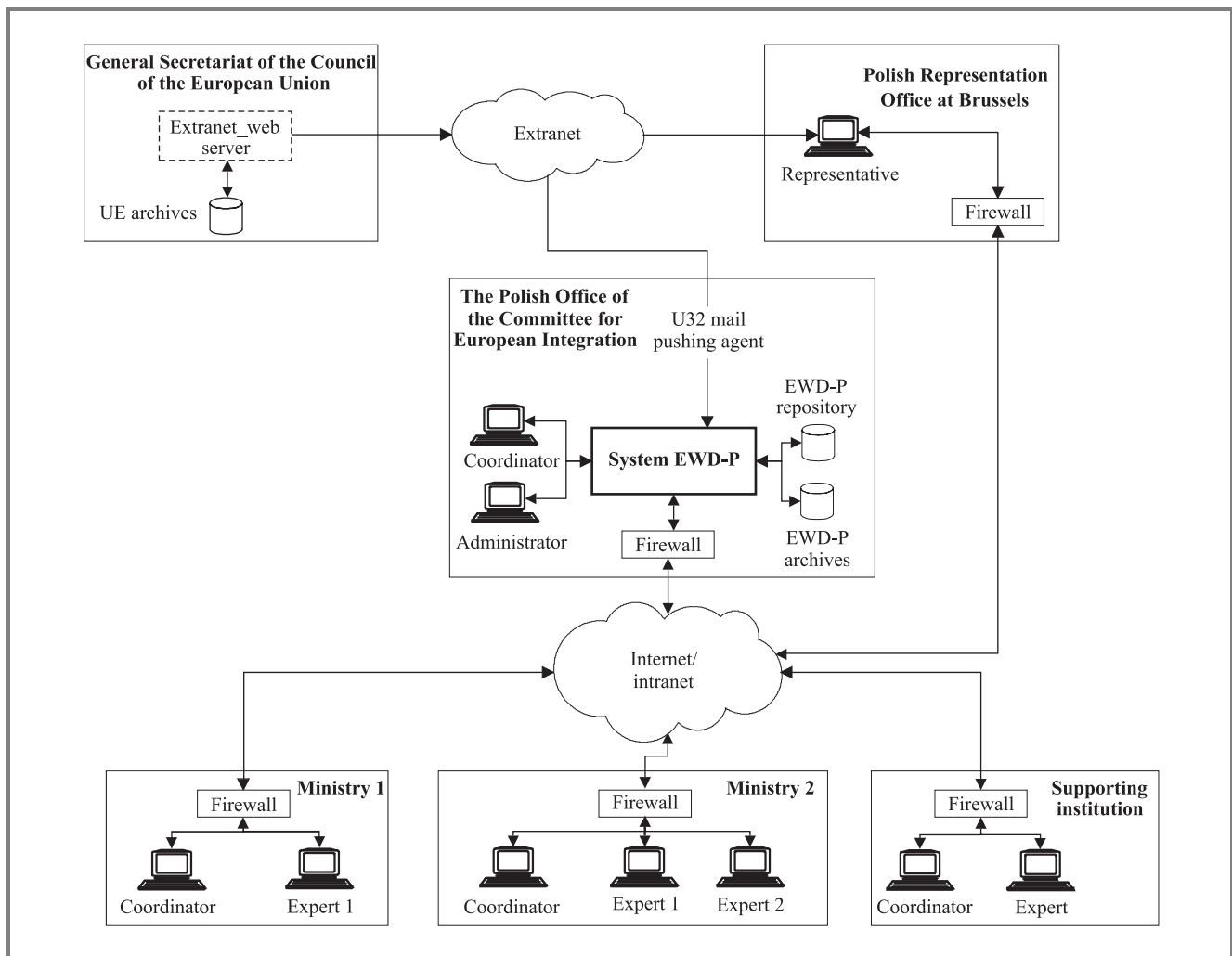


Fig. 1. The EWD-P system architecture.

- pre-defined categories of documents and cases (according to acronyms, authors/persons engaged, working groups);
- storing versions of documents;
- structural retrieval (using attributes) and full text retrieval.
- Workflow coordination:
 - definition of workflow processes of elaboration of standpoints and instructions;
 - providing a list of users' tasks.
- Diary of meetings of working groups, COREPER and the Council of EU:
 - automatic registration of meetings triggered by a note from the U32 mail system;
 - integration of the diary with cases and documents and the process of elaboration.
- Configuration of the system – meta-information management:
 - management of Polish administration structure management;
 - providing the EU and Polish topical classification of cases;
 - registration of advisors' certificates and domains of interest;
 - users' authorizations management.
- Notification module:
 - generating automatic notification of delays and other information relevant for persons engaged in a particular case;
 - sending and receiving notifications to/from other system's users.
- Connections module.
- Help module.
- Personalization:
 - adjustment of views to a user's role;
 - setting-up a user's preferences.
- Replacement services.
- Web access.

2.4. Implementation

The most exciting aspect of this implementation was the potential it opened up for the convergence of a number of new technologies. Achieving compatible operation with the European Commission General Secretariat required providing solutions to several advanced technological problems including the use of artificial intelligence techniques for document categorization as well as an intelligent workflow management functionality to support complex documents flow through the quagmire of the central government administration.

To satisfy the above goals required sophisticated skills in designing and programming area coupled with deep knowledge of the subject.

The EWD-P system has been split into a number of modules. A short description of the main modules is presented below.

2.4.1. Notification

This module provides for automatic notification of system users regarding delays in completion of a allocated task in the process of position elaboration. The module also notifies the user when an important situation arises in the elaboration process (e.g., appearance of a new version of a document). The user is notified of crucial incidents affecting decision-making process (change of dates of meetings, projected absence of crucial users, etc.). The module allows sending notifications to other system users. Notifications can own notes to documents and cases placed in system.

2.4.2. Tasks

This module is responsible for steering the process of working out a response to received EU documents. Based on meta-information stored in the system, a semi-automatic or automatic classification of these documents is performed. Documents are distributed to relevant departments and expert advisors. A group of experts prepares a document of position or instruction, which after acceptance, is passed to the Polish representative at the EU in Brussels. The representative then presents such worked-out position during a workgroup or COREPER committee meeting. The minutes indicating the most important issues discussed during these meetings are registered in the system. The report, containing feedback from cases discussed at the meeting, is made available to system users, including the advisory group, which elaborated the original position.

2.4.3. Supporting cooperation between advisors

This module is directly connected with the tasks module. It supports and records the flow of discussion between advisors taking part in the decision-making process. Experts can present point of view of departments, which they represent, in the form of documents registered on a given

forum. This information is confidential and is made selectively available to a working group directly involved in elaborating the position for a given case.

2.4.4. Documents

This module is responsible for a management of documents received via U32 mail or registered manually and also documents created during the process of elaboration (standpoints, instructions, other documents).

The module allows:

- registration of documents send by U32 mail system, which are coming to a dedicated e-mail address;
- addition and editing of new documents (description attributes and files-attachments);
- publication of documents (making them available to other users);
- creating and recording new version of an existing document;
- documents searching using attributes (e.g., type, language) and full text searching.

2.4.5. Cases

A case is created when a new document is registered, which is not related to an existing case. Otherwise the document is added to the existing case. The case is closed automatically once a position has been worked-out.

The module allows browsing of all cases registered in system. Cases can be searched by a number, description, subject or by a name of a person connected with the case. Any discussion related to this case might be looked at as well. Also a history of process realization can be examined (process chart and activity list in process).

2.4.6. Diary

This module allows browsing of information gathered in the system about working group meetings on which the elaborated standpoints are presented. The information on these meetings are taken from messages coming via U32 mail system and from coordinators, experts or the Polish Representation Office at Brussels. The module allows also registration of an agenda and linking it with an appropriate meeting. This is done automatically by the system or manually if the source of the document containing an agenda is outside the U32 mail system. Users are able to register other documents related to the particular meeting (e.g., an instruction for Polish representatives, reports). Meetings can be searched by attributes (e.g., meeting's code, EU working group's code, location, date, participants, discussed cases, etc.).

2.4.7. Configuration

This module coordinates a task of configuration management and enables definition of the metadata which is necessary for a proper working of the system such as: users, roles, organization units, working groups, UE subjects, Polish subjects and other dictionaries. It also defines various cross references between the metadata and sets other parameters needed by the system. The module allows browsing, editing, activation and deactivation of these elements and facilitates setting up dependencies between them. The system creates a full history of any change to the configuration.

2.5. Workflow engine

The EWD-P system dynamics is imposed by processes executed by the workflow engine – one process instance for each group of EU documents on one meeting. The workflow starts from publication of an original document on the U32 mail gateway, continues through initial dispatching in the Committee for European Integration, precise dispatching on the level of particular ministries' units (government's departments), establishing collaboration among the selected experts, elaborating of a final standpoint and ends up with the final delivery to the Polish Representation Office at Brussels. The Polish response preparation activities are supervised by a leading expert. At the end of this stage, all involved experts vote on the approval of the final Polish standpoint in the given case.

A single generalized workflow process type has been sufficiently powerful to support flows pertaining to any of the individual case categories involving a host of distinct agencies and individuals invoked in the appropriate roles to provide indispensable expertise. Advanced time modelling techniques have been employed to avoid delays in providing government position papers that might result in default official consent with respect to a particular issue.

Electronic records of government proceedings including all official and intermediate case documents as well as the workflow process information are maintained in the one central repository based on relative database, to provide invaluable reference material for government analysts.

Controlled access to the EWD-P system is provided for all participants via the open Internet with security supported by an elaborated role-based user access right model and the SSL data encryption. Electronic signature is available to support document authorization whenever required.

Each incoming EU document is categorized along the predefined EU classification system. Categories are just multiple values in a given attribute of the document's "envelope" – characteristics of the document as nature, source and destination. This set of categories determines receivers of the document in the Polish administration. The problem is that the Polish and EU classification systems are not unified yet and vary both in the sense of languages and in the sense of the categorization power. One EU category can be mapped to several Polish categories. Similarly, one Polish

category can be mapped to several EU categories. The approach applied in the EWD-P system is based on ontology implemented as the topic map. The EWD-P ontology, constituting the logical heart of the system, provides mapping between inconsistent set of concepts [1].

The EWD-P system ontology **manages information on each civil servant or government organizational unit** (represented as topics) that are involved in the standpoint elaboration process. There are complex relationships among experts, units and categories cover, e.g., person and organizational unit (is employed in), person and category (is an expert in), organizational unit and category (is responsible for). The relationships, modelled as associations and exploited by the workflow engine, allow for precise selection of the most suitable (knowledgeable) experts and the responsible unit.

Finally, the EWD-P ontology, although serving various purposes (out of which interoperability is the most important), is internally consistent and play the vital role in the end users' education and communication.

The implementation of the EWD-P dynamics is fully based on the workflow management technology. The workflow process explicitly defined in the form of conceptual business process model and XML process definition language (XPDL) is **responsible for classification and distribution of the EU official documents as well as for preparation of the Polish response**. The process of elaboration of the Polish standpoint is instantiated for every incoming EU document and then executed by the workflow management system.

The major challenge addressed by the workflow engine in the EWD P system was to optimize workflow processes executions in order to **"to assure that appropriate activities will be performed by the right (knowledgeable) participants based on pertinent information in due time"**. A process instance is perceived by the workflow participant through a task list in which all commitments of a given user (possibly involved in a numerous cases) are sorted along with some priorities.

The **one central repository** based on relative database includes full collection of information concerning all the standpoints' elaboration process.

3. The good practice

3.1. Impact

The obvious benefits of the implementation of EWD-P system are as follow:

- Reduction of time of the documents distribution to coordinators and experts, in turn experts have more time for elaboration of the Polish position.
- Expansion of U32 mail system capabilities in classification and distribution of EU documents.
- Improvement and automation of classification and distribution of EU and Polish documents.

- Provision of proper instruments supporting the process of creation of Polish topics' classification and design of a method of establishing a relation between Polish and EU topics.
- Provision of mechanisms supporting communication between departments and various experts in the process of Polish standpoints elaboration.
- Possibility of monitoring progress of elaboration process for each case.
- Automatic warnings by the system of unusual situations such as delays, possibility of missed deadlines, etc.
- Opportunity for on-line collaboration between experts and swift resolution of arguable problems.
- Availability of refined search facility (cases and documents by their attributes, content, and history of execution).
- Enabling access to historical information.
- Management of proficient document exchange among Polish institutions.

The EWD-P system simplifies interactions between Polish government departments (ministries) working on elaboration of the common state. Owing to implementation of the EWD-P system, the several important changes have taken place in a approach of government's departments to UE legislative process. The first homogenous, over-departmental topics' classification was introduced. It facilitates a better organization of work in ministries and other public administrations institutions that are involved in UE legislative process. The one mutual process of elaboration of the common standpoint has been defined and implemented. That is uniform process for all users across the government's departments. Due to implementation of the EWD-P system the Polish experts have instant access to key information concerning Polish standpoint's elaboration process. Moreover, owing to workgroup platform and collaboration facility they can communicate immediately among themselves to resolve any arising issues instantly, even if the experts are miles apart.

The EWD-P system has been successfully deployed in the Polish Office of the Committee for European Integration (UKIE) and all of Polish ministries. End users represent experts and coordinators from over 20 government's departments, central government agencies and other public institutions. At present the system has over 1000 of registered users. Daily documents' flow rate is 150 documents on average. The highly productive workflow-based environment ensures that the processes execution times for recorded cases vary from 2 to 14 days. Over 8 million pages of electronic documents are already stored in system repository.

Full deployment of EWD-P is planned to end in 2006. Over 10 000 end users cooperating with over 2000 working

groups and numerous committees will take an advantage of the powerful functionality of the system.

3.2. Relevance of the case for other administrations that could learn from the experience

So far, the European Union has not worked out a common standard for collaboration work on EU procedures and regulations with newly associated states. Poland's example is one of the "case study" for our EU partners. The logic of the EWD-P system can be used as a template or a model for similar systems defining different processes, different topics and issues in inter-institutional and multi-organizational arena.

There are several features of the EWD-P system, that can be used in other administration's solutions:

- **The new way of process definition** based on a topics' classification.
- **Creation of the knowledge base of administration's processes** – the new procedures were defined in particular departments and institutions.
- **The EWD-P system could be a platform for new administration's services** – the possibility exists to create new processes, cases and documents.

The EWD-P system is great, implemented model of well planned complex administrative solution.

Demonstrated approach in this solution to document and process management has been acknowledged path to improve effectiveness and efficiency whilst saving valuable time.

3.3. Transferability

The EWD-P system can be easily transferred due to sophisticated metadata mechanism. There is a possibility of implementing EWD-P system in any country. To launch this system in other countries we have only to satisfy the following requirements:

- to define public administration's structure (ministries, departments, units, subsidiary institutions, etc.);
- to define a topics' structure (classification module);
- to define roles participating in the process;
- to register users and link them with a particular topic and previously defined role.

Experiences gained during realizations and practical usage of the EWD-P system, might be used and absorbed by any of a public administration institution, that demands execution of several related processes and presence of a central repository.

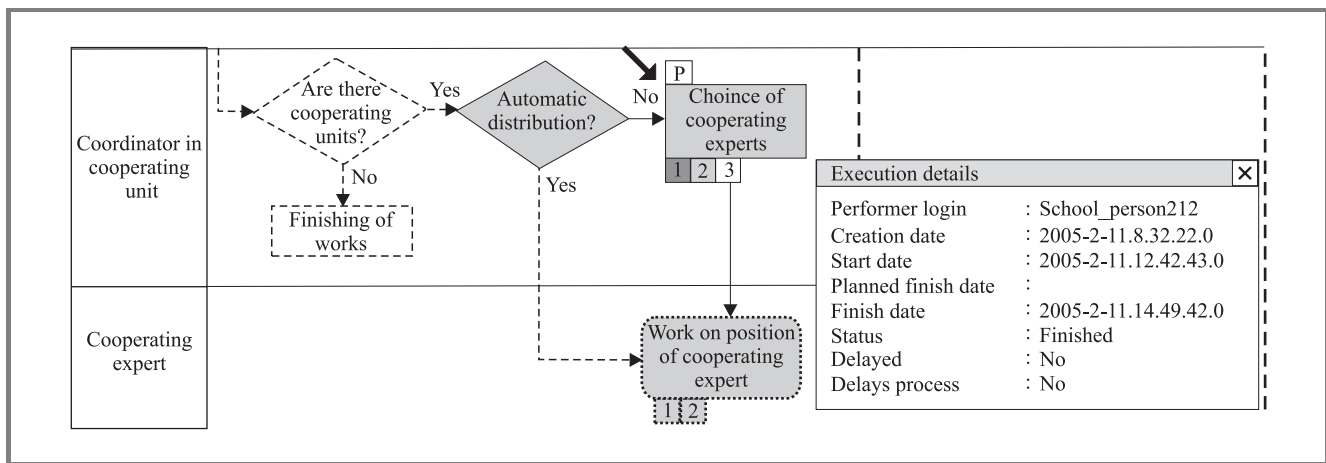


Fig. 2. An example of a process execution visualization.

4. Results

Benefits from the implementation of EWD-P system and work transformation of civil servants taking part in the Polish standpoint elaboration process is undisputable. The EWD-P system is based on the workflow paradigm. The key results that made the workflow engine successful within the EWD-P system are presented below.

- Assignment of workflow participants is dynamic.** The workflow engine uses the rules of assignment of experts and organizational units to documents' categories according to the competence they have (carefully specified in the EWD-P ontology) or based on the role they already played in previous activities of a given process instance (e.g., let B will be carried out by the same person that carried out A). For instance, the Polish Ministry of Infrastructure is responsible for the “aviation” category. Let's further assume that there is one coordinator (responsible on the ministry level) and two candidate leading experts in this ministry. The system suggests to the coordinator these two candidates and allows selection of the most suitable one (tacit knowledge application).
- Communication among process participants is flexible.** Usually, the coordinator monitors progress of elaboration of the Polish standpoint and, if necessary, gives some hints and feedback to the experts involved to improve the quality. This communication pattern is difficult to express in the form of the traditional workflow process, since there is no algorithm defining when this communication occur and in which way it will be carried out. Thus, to complement strict rules of the traditional workflow processes, a mechanism of team collaboration management (TCM) has been introduced. This is important as especially teams creating new knowledge need more elastic forms of cooperation with more space left for innovation, creativity and spontaneity. Messages of various natures are grouped in thematic

threads and moderated by the coordinator. Integration between workflow process and TCM assumes 2 dimensions: time and participants. The discussion forum is active from the elaboration process commencement up to the process termination (read only mode is available then). As participants are identified dynamically during the process enactment on the base of WPAL rules valuation, they are joined to the TCM as soon as they are selected by the workflow system (starting from the process owner during the process initialization). Since this moment he/she can read messages, start new threads and reply to messages of others. The discussion-forum-like facility fosters unconstrained collaboration of the process participants, what is really indispensable while complex, interdisciplinary and multidimensional problems are addressed.

- As Polish standpoints have to be prepared before some deadline, **time management** is of particular importance. If a standpoint is not prepared on time, the delivered EU document is accepted with no objection. Therefore, it is crucial to detect and signalize any delay in the process as soon as it occurs both on individual activity level as well as on the overall process level. To meet this requirement the ICONS workflow engine extends and implements time management algorithm proposed in [2]. This algorithm checks the deadline and duration constraints for the whole process and for its individual activities. It also determines the best and worst cases for these constraints taking into consideration different possible scenarios (paths) of the process execution. The predefined workflow participants (especially coordinators) are informed on delays. EWD-P system allows to select the optimal group of notified participants.

To mitigate the problems following from the standpoints elaboration process complexity (a lot of activities, a significant number of spread geographically organizational units

and thousands of potential participants) a facility of **process execution visualization** in a human-readable form is used (Fig. 2). This graphical representation of the process instance (on the contrary to the visualization of the process definition) is an extension of the business process modelling notation. This visualization allows performers to better understand the process history (what was done before, by whom, what were the recommendations, what were the time constraints), presence (what its current state is, what are the requirements for the current activity) and future (who will continue the process, what are potential consequences of current decisions). As the work items (picked up from individuals' tasks list) are put into definitely broader context, it positively impacts participants' knowledge and consequently improves productivity and quality.

5. Conclusion

For the majority of the EU documents a Polish response must be prepared and delivered by a certain date. If the deadline for preparation is not met, it is assumed that there is no objection to the original EU document and that the document is fully accepted. When the Polish response is prepared, it is sent to the Polish Representation Office at Brussels which in turn presents the document to the council's pertinent teams.

From the information management point of view the "case" concept plays the crucial role as it secures all information related to a given response. This comprises the original EU document (triggering the corresponding case; perhaps in versions), response, related cases, external documents, etc. The cases are maintained by cooperating experts who attach the consecutive versions of the Polish response as well as other relevant information (e.g., legislative documents). The cases store minutes of meetings on which Polish representatives present the Polish response (this includes remarks and comments).

It is critical to ensure consistency with other cases and, to the same extent, preserve the information on previously existing cases that somehow influenced a given response. A net of relations among cases facilitates navigation among related cases and promotes the access to global view on some issues rather than to its individual aspects.

Besides its mission-critical functionalities the EWD P system serves a number of auxiliary services. First of all, the users can search over the repository of documents and cases using attribute-based search (supported by user friendly search criteria builder) and full text search. This covers also European documents repository, accessible via the U32 gateway. This fosters knowledge reuse based on previous experiences. Secondly, the system provides full accountability of experts' decisions by storing the information on contributions of individuals to the documents and cases as well as their behaviours in a concrete workflow process instance (e.g., missed deadlines). Thanks

to this, in the case of any problems concerning the essentials of a given standpoint, the standpoint's development history can be examined in every detail. The complete information on cases (together with specific contributions provided by individuals) are archived according to the stringent central government practices and standards and accessible for search as well as retrieval but closed for any modifications.

The EWD-P solutions offer many immediate practical benefits, described in previous sections of this paper, as well as a platform for the future to help public institutions to keep pace with the remorseless rise in expectation.

The EWD-P system is at the forefront of developments in this area, which is still at the embryonic stage – but which will accelerate rapidly as the government's departments move towards a process based approach in their performance of daily tasks. Whatever the outcome of prepared Poland's IT strategy with reference to public administration is, today's EWD-P solutions have been designed and built to provide the systems foundations for tomorrow, delivering decision on vital issues when and where it is required.

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